



## Dengue Fever Frequently Asked Questions (FAQ) (Full List)

15 December 2015

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## **Hawaii Island Outbreak**

### **Where on the Big Island are the cases located?**

The investigation is still underway, and the Department of Health (DOH) is still investigating possible areas where cases may have been exposed to infected mosquitoes. Current investigations have identified South Kona (in particular Hookena and Honaunau) as an area of particular concern, but the entire island is considered to be at risk. ALL islands in the state should be vigilant and take measures to reduce mosquito breeding grounds.

### **Could it spread to the other islands?**

Dengue is not normally present in the State of Hawaii, and it's important to keep the risk of dengue in Hawaii low. The mosquitoes that are capable of spreading dengue fever are present statewide; this is why, when we hear of suspect dengue cases (imported or otherwise), the department promptly does a thorough investigation to prevent further spread of disease. Regardless of where you are, though, it is a good idea to avoid mosquitoes and protect yourself from mosquito bites (see "[How can you keep from getting it?](#)" on page 7).

### **Is it safe to travel to the Big Island and the rest of Hawaii?**

Absolutely, yes. The Big Island and the rest of Hawaii remain safe destinations for visitors and residents. The current outbreak is very small by global standards, and minor compared to other popular tropical tourist destinations.

All travel involves at least some risk, but visitors can, in general, reduce their risk by protecting themselves against mosquitoes and mosquito bites by using mosquito repellent that contains

DEET and covering up with appropriate clothing no matter where they go (see “[How can you keep from getting it?](#)” on page 7). Precautions should especially be taken when going into areas where mosquito activity is likely.

### **How many cases have there been?**

The investigation is still ongoing. We are still actively seeking cases, following up on reported illnesses, so the number of cases continues to change. Visit the DOH Dengue Outbreak 2015 webpage for updates and information (<http://health.hawaii.gov/docd/dengue-outbreak-2015/>).

### **Do I have the symptoms of dengue?**

If you are concerned that you may have symptoms related to dengue (which can include fever, severe headaches, pain behind the eyes, joint and/or muscle pain, and rash), you should contact your healthcare provider and avoid further exposure to mosquitoes (see “[What are the symptoms of dengue fever?](#)” on page 5).

*If you are ill and are worried that you might have dengue fever, it is important that you be evaluated by a healthcare provider. Many of the initial symptoms of dengue can overlap with other conditions that require specific treatment (like leptospirosis); additionally, a small number of individuals with dengue can go on to have severe dengue (see below), and it is important that individuals with dengue be monitored by a healthcare provider to ensure that they are not progressing to severe dengue.*

### **What type of dengue viruses have been identified in this outbreak?**

There are four closely related dengue viruses (DENV 1, DENV 2, DENV 3, and DENV 4). The current 2015 Hawaii Island outbreak involves DENV 1 serotype virus.

### **Can I get tested for dengue?**

If you are at all concerned that you might have dengue, you should contact your healthcare provider and avoid further exposure to mosquitoes.

If you were ill and more than a week has passed since the time of illness, an antibody test can determine whether you were previously infected with dengue. However, determining which dengue virus type you had is not possible after the first week of illness.

*If you are ill and are worried that you might have dengue fever, it is important that you be evaluated by a healthcare provider. If you do not have a provider, please go to a community health center for care. Many of the initial symptoms of dengue can overlap with other conditions that require specific treatment (like leptospirosis); additionally, a small number of individuals with dengue can go on to have severe dengue (see below), and it is important that individuals with dengue be monitored by a healthcare provider to ensure that they are not progressing to severe dengue.*

*If you think you might have had dengue recently, but didn't see a healthcare provider (or were not tested for dengue by your provider), contact DOH (see “[Who do I contact with other questions about dengue fever?](#)” on page 4).*

**Can I get mosquitoes tested for dengue? Can someone come and spray my property for mosquitoes?**

Mosquito testing for individuals is not something that the DOH is able to offer. Department staff have been conducting on-going assessments for mosquito activity and may as a precaution be spraying in areas; DOH necessarily is prioritizing areas of concern identified through our investigations. However, everyone can help in reducing risk from mosquitoes around their homes and businesses (see “[What steps should be taken to reduce mosquito nuisance at home?](#)” on page 8). Individuals or businesses who additionally wish to have their property sprayed against mosquitoes may opt to use private pest control services.

**What substance is used in the spraying of mosquitoes?**

The spray that is used is Aqua Reslin, which targets live adult mosquitoes. Although we recommend that people and pets stay away from treated areas for several hours as a precaution, the U.S. Environmental Protection Agency (EPA) has determined that the spray poses no health risk to humans or their pets.

**Is the spray dangerous to my pets?**

One of the active ingredients in Aqua Reslin can be toxic to fish, such as ornamental fish in ponds. The substance has been used as a flea treatment in dogs and cats, but as a precaution it is advisable to keep them away from sprayed areas for several hours.

**What is being done to stop dengue from spreading?**

DOH is actively conducting an investigation into identified cases, as well as working to identify additional cases and evaluate for on-going transmission of disease. Department staff are also conducting assessments of areas of concern for the presence of mosquitoes and may as a precaution spray areas specifically related to our ongoing investigation.

Just as importantly as the investigating and assessing, DOH, Hawaii County, and many other partners are reaching out to residents and visitors to *Fight the Bite!* by helping to eliminate mosquitoes and keep from getting bitten (see “[How can you keep from getting it?](#)” on page 7, and “[What steps should be taken to reduce mosquito nuisance at home?](#)” on page 8).

**Can the Department of Health release the locations of confirmed dengue cases? I understand that the names of people may need to be kept private, but why can't the locations be disclosed?**

We appreciate the desire to have precise information regarding locations, but many or most of the locations can be used to identify a person who is likely a patient, and patient confidentiality is something we must protect. Additionally, the location of dengue case locations does not necessarily represent where each of those cases was bitten and infected. Maps of outbreak areas of concern can be found at: <http://health.hawaii.gov/docd/files/2015/12/dengue-info-map-20151202.jpg> and [www.hawaiicounty.gov/active-alerts](http://www.hawaiicounty.gov/active-alerts).

**Who do I contact with other questions about dengue fever?**

*If you have general questions about dengue fever, mosquito avoidance recommendations, or the ongoing Big Island dengue investigation, call Aloha United Way's 2-1-1 hotline.*

***If you are ill and are worried that you might have dengue fever, it is important that you be evaluated by a healthcare provider.*** If you do not have a provider, please go to a community health center for care. Many of the initial symptoms of dengue can overlap with other conditions that require specific treatment (like leptospirosis); additionally, a small number of individuals with dengue can go on to have severe dengue (see [“What is dengue fever?”](#) on page 5), and it is important that individuals with dengue be monitored by a healthcare provider to ensure that they are not progressing to severe dengue.

***If you think you might have had dengue recently, but didn’t see a healthcare provider (or were not tested for dengue by your provider), contact:***

- Hawaii County: 808-974-6001 or 808-322-4880
- On other islands: DOH Disease Outbreak Control Division at 808-586-4586

***If you have specific mosquito concerns (on your property or elsewhere in your community), contact:***

- Hawaii County: 808-974-6001 or 808-322-4880
- City & County of Honolulu: 808-586-8021
- Maui County: 808-873-3560
- Kauai County: 808-241-3306

## **General Questions about Dengue Fever**

### **What is dengue fever?**

Dengue fever is a viral illness spread by mosquitoes. There are four closely related dengue viruses (DENV 1, DENV 2, DENV 3, and DENV 4). These viruses are transmitted to humans by the bite of an infected mosquito. The disease occurs mainly in tropical Asia, Africa, the Caribbean, and the South Pacific. It is most common during the rainy season in areas infested with infected mosquitoes. Sometimes, persons arriving from other countries may enter the United States with dengue fever and infect local mosquitoes, as happened in Hawaii in 2001 and 2011. The current 2015 Hawaii Island outbreak involves DENV serotype 1.

### **How do you get it?**

The dengue virus is spread through the bite of infected *Aedes* mosquitoes. Dengue CANNOT be spread directly from person to person. It is estimated that there are over 100 million cases of dengue worldwide each year.

### **What are the symptoms of dengue fever?**

The symptoms of dengue fever include sudden onset of fever; severe headaches; eye, joint, and muscle pain; and rash. The rash typically appears on the hands, arms, legs and feet 3 to 4 days after the fever begins. Minor bleeding problems can also occur. The symptoms usually go away completely within 1 to 2 weeks. Sometimes, people with dengue fever have blood clotting problems. When this happens, the illness is called severe dengue. Severe dengue is a very serious illness with abnormal bleeding and very low blood pressure (shock).

**When do symptoms start?**

The symptoms usually start 5 to 7 days after being bitten by infected mosquitoes, but the onset can range from 3 – 14 days.

**Is it possible to be infected with dengue virus but have no symptoms?**

Yes. As many as 50-75% of all dengue-infected people have no clinical signs or symptoms of the disease. Some infected people experience fever but their other symptoms are mild and non-specific, making their dengue infection difficult to diagnose. Ill persons who suspect they have dengue should see a healthcare provider.

**Can people who are infected but have no symptoms transmit the virus to mosquitoes?**

Some evidence suggests that it is possible for asymptomatic people infected with dengue virus to transmit the virus to mosquitoes who bite them, although the role of asymptomatic transmission in dengue-affected areas is still unclear. Such risk makes it all the more important that everyone take precautions against mosquitoes (e.g., eradicating mosquito breeding grounds, covering up exposed parts of the body, and using insect repellent) to avoid being bitten and infected in the first place.

**What is the treatment for dengue fever?**

There is no specific treatment for dengue fever. Bed rest and acetaminophen (Tylenol) to treat fever and pain are recommended. Aspirin and NSAIDs (ibuprofen, naproxen) are NOT recommended as they can make bleeding problems worse. There is currently no vaccine for dengue fever. Individuals with dengue should seek out medical care.

**Do pregnant women or breastfeeding mothers need to take extra precautions?**

It is possible for a pregnant woman who is infected with dengue virus to infect her unborn baby or her newborn baby at birth. It is especially important that pregnant mothers receive proper medical attention if infected with the dengue virus. Like everyone else, pregnant women should focus on avoiding becoming infected by eliminating standing water where mosquitoes can breed, covering up exposed areas of the body to avoid being bitten, and using repellent containing DEET, picaridin, IR3535, or oil of lemon eucalyptus, which are approved for pregnant women.

The risk of a mother transmitting the virus to her newborn through breastmilk is considered low, and the health benefits of breastfeeding greatly outweigh the likelihood of disease transmission. Ultimately, breastfeeding mothers should consult with their pediatrician about concerns they have regarding breastfeeding and dengue risk.

**If you get dengue fever once, can you get it again?**

Yes. There are four major types of dengue viruses (DENV 1, DENV 2, DENV 3, and DENV 4). Having dengue fever with one type of dengue virus will not protect you from the other three types.

If you want to get tested for dengue fever after more than a week has passed from the time you were ill, an antibody test can determine whether you were previously infected with

dengue. However, determining which dengue virus type you had is not possible after the first week of illness.

#### **How can you keep from getting it?**

- When traveling to areas that have dengue fever, try to avoid exposure to mosquitoes. *Aedes* mosquitoes are usually most active in the early morning hours after daybreak, in the late afternoon before dark, and any time during the day when indoors or in shady areas.
- Use mosquito netting over beds, and screens on windows and doorways.
- Use mosquito repellents with 20-30% DEET and wear appropriate clothing, such as long-sleeved shirts and long pants that reduce exposure to mosquito bites.
- Mosquitoes are drawn to dark colors; if possible, wear white or light colored clothing when you are likely to be exposed to biting mosquitoes.

#### **Do people who have contracted dengue fever need to be quarantined?**

Dengue fever cases do NOT require quarantine, because dengue fever is not spread from person to person. The dengue virus is spread through the bite of an infected mosquito, so the most effective way to prevent future cases is to eliminate mosquitoes that might bite infected persons and then spread the virus to uninfected persons. Quarantines are extreme measures that are effective primarily for serious diseases spread by human-to-human contact.

### **MOSQUITOES**

#### **Are all mosquitoes alike?**

No. Mosquitoes have been around for millions of years. In that time, they've diversified into about 3,000 species worldwide. They have successfully adapted to climates from the arctic to the tropics. Some mosquitoes bite humans while others prefer other animals and some even just sip plant nectar; some transmit diseases, while others do not; some are active during the day, others at night; some prefer to breed in clean water, others in dirty ponds and swamps.

#### **Do all mosquitoes bite?**

No. Only the females bite. Female mosquitoes require the protein of a blood meal for development of their eggs – they do not feed on blood for their own nourishment. Since blood is only required to build eggs, the males do not take blood, but rather feed on plant nectar.

#### **Can dengue be passed from the female mosquito to her offspring?**

There is some evidence that an infected female mosquito can pass the dengue virus to her eggs, but transmission by an infected mosquito to a human and from an infected human to a mosquito remain the primary routes of concern. Eliminating mosquito breeding grounds and avoiding being bitten remain the most effective courses of action.

#### **What are common mosquito breeding sites to watch for?**

Heavy mosquito nuisance usually indicates a nearby breeding source. Make a systematic and thorough inspection around your home. Common breeding sites are in water found in old tires, clogged roof gutters, cans, bottles, unused swimming pools, unused fish ponds, pineapple lilies

(bromeliads), hollow bamboo stumps, hollow tree stumps, uncapped hollow tile walls, uncapped fence pipes, and overflow trays under house plants.

**What steps should be taken to reduce mosquito nuisance at home?**

- Remove or empty anything that catches or holds standing water, such as old tires, flowerpots, toys, buckets, and plastic tarps on your premises.
- For plants that hold water, flush with a hose or spray with soapy water once a week.
- Use mosquito-eating fish, such as guppies, in unused swimming pools, constructed fish ponds with no outlet to the environment, or other large containers that cannot be removed or emptied of standing water. To protect Hawaii's rare native species and aquatic habitats, do not release guppies or other alien species into the natural environment.
- Install or repair window screens and doors to keep out mosquitoes. Screens are your best protection against mosquito nuisance in your home.
- Clean your gutters. Remove leaves and debris so water will drain freely.

**If I have contracted the dengue virus, how long am I infectious to mosquitoes?**

A person infected with the dengue virus can transmit the infection to a mosquito starting around the time the first symptoms appear. The risk of transmission is highest when the virus is most strongly present in an infected person, typically in the first few days after fever begins and lasting about a week. After several days, the presence of the virus drops considerably.

Individuals who have been infected with dengue virus should be especially cautious about coming into contact with mosquitoes and should avoid being bitten, in order to prevent their infection from being transmitted to mosquitoes who may go on to spread the virus to other people.

**What steps can be taken for immediate temporary control?**

- Eliminate adult mosquitoes with aerosol insecticide labeled for flying insects.
- Use insecticides specifically labeled for controlling mosquito larvae in breeding sites that cannot be emptied or removed. Consult a garden shop or a chemical company for available insecticides.
- Carefully follow the insecticide label's instructions for use

*CAUTION: Certain pesticides and their solvents may cause respiratory irritation. Persons with respiratory diseases should consult their physicians before using any pesticide. It is a violation of federal law if pesticides are not applied exactly as the label directs. Insecticides can be harmful to people, pets, wildlife, and the environment when used improperly. For more information on proper pesticide use, go to <http://hdoa.hawaii.gov/pi/pest/faq-for-pesticides>.*

**How can I protect my children from mosquito bites?**

Children (and adults) can wear clothing with long pants and long sleeves while outdoors. DEET or other repellents such as permethrin (not registered for use on skin) can also be applied to clothing, as mosquitoes may bite through thin fabric. Mosquito netting can be used over infant



carriers. Also, try to reduce the number of mosquitoes in the area by getting rid of containers with standing water that provide breeding places for mosquitoes.

## **USING REPELLENTS SAFELY**

**CAUTION:** *Always read the entire label before you use insect repellent and apply exactly as the label directs.*

### **Why should I use insect repellent?**

Insect repellents can help reduce exposure to mosquito bites that may carry viruses, such as dengue fever or West Nile virus, that can cause serious illness and even death. Using insect repellent allows you to continue to play and work outdoors with a reduced risk of mosquito bites.

### **When should I use mosquito repellent?**

Apply repellent when you are going to be outdoors. Even if you don't notice mosquitoes, there is a good chance that they are around.

### **How often should repellent be reapplied?**

In general you should re-apply repellent if you are being bitten by mosquitoes. Always follow the directions on the product you are using. Sweating, swimming, or otherwise getting wet may mean that you need to re-apply repellent more frequently. Repellents containing a higher concentration (higher percentage) of active ingredient typically provide longer-lasting protection.

### **Which mosquito repellents work best?**

CDC recommends using products that have been shown to work in scientific trials and that contain active ingredients which have been registered with the US Environmental Protection Agency (EPA) at <http://www2.epa.gov/insect-repellents/using-insect-repellents-safely-and-effectively> for use as insect repellents on skin or clothing.

Of the active ingredients registered with the EPA, CDC believes that two have demonstrated a higher degree of efficacy in the peer-reviewed, scientific literature. Products containing these active ingredients typically provide longer-lasting protection than others:

- DEET (N,N-diethyl-m-toluamide)
- Picaridin (KBR 3023)

Oil of lemon eucalyptus [active ingredient: p-menthane 3,8-diol (PMD)], a plant-based repellent, is also registered with EPA. In two recent scientific publications, when oil of lemon eucalyptus was tested against mosquitoes found in the U.S., it provided protection similar to repellents with low concentrations of DEET.

### **What are some general considerations to remember when using insect repellents?**

Always follow the recommendations appearing on the product label.

- Use enough repellent to cover exposed skin or clothing. Don't apply repellent to skin that is under clothing. Heavy application is not necessary to achieve protection.

- Do not apply repellent to cuts, wounds, or irritated skin.
- After returning indoors, wash treated skin with soap and water. (This may vary depending on the product. Check the label.)
- Do not spray aerosol or pump products in enclosed areas.
- Do not spray aerosol or pump products directly to your face. Spray your hands and then rub them carefully over the face, avoiding eyes and mouth.

### **What are guidelines for using a repellent on children?**

Always follow the recommendations appearing on the product label when using repellent:

- Repellents containing DEET should not be used on infants less than 2 months old, and certain other repellents may not be appropriate for young children (e.g. oil of lemon eucalyptus should not be used with children less than age 3 years).
- When using repellent on a child, apply it to your own hands and then rub them on your child. Avoid children's eyes and mouth and use it sparingly around their ears. After returning indoors, wash treated skin with soap and water.
- Do not apply repellent to children's hands. (Children may tend to put their hands in their mouths.)
- Do not allow young children to apply insect repellent on themselves; have an adult do it for them.
- Keep repellents out of reach of children.
- Do not apply repellent under clothing. If repellent is applied to clothing, wash treated clothing before wearing again. (This recommendation may vary by product; check label for specific instructions.)
- Follow product instructions – using more won't give you extra protection but may increase risk.

### **Can insect repellents be used by pregnant or nursing women?**

Other than the routine precautions noted earlier, EPA does not recommend any additional precautions for using registered repellents on pregnant or lactating women. Consult your health care provider if you have questions.

### **What are some reactions to be aware of when using insect repellents?**

Use of repellents products may cause skin reactions in rare cases. Most products also note that eye irritation can occur if product gets in the eye. If you suspect a reaction to a product, you should discontinue use, wash the treated skin, and call a poison control center. If product gets in the eyes, flush with water and consult your health care provider or poison control center. If you go to a doctor, take the product with you.

There is a national number to reach a Poison Control Center near you: 1-800-222-1222.

### **Where can I get more information about repellents?**

For more information about using repellents, please consult the Environmental Protection Agency (EPA) at: <http://www2.epa.gov/insect-repellents/using-insect-repellents-safely-and-effectively> or consult the National Pesticide Information Center (NPIC), which is cooperatively sponsored by Oregon State University and the U.S. EPA. NPIC can be reached at: [npic.orst.edu](http://npic.orst.edu)

or 1-800-858-7378. For information on proper pesticide use, visit the Hawaii Department of Agriculture at: <http://hdoa.hawaii.gov/pi/pest/faq-for-pesticides>.